

ABSTRACT

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An apparatus for measuring the composition of coal and mineral ores on-line, by bombarding a sample stream with low energy X- rays and measuring the characteristic X- rays fluoresced. The assembly is comprised of one or more X- ray generators mounted in a specific geometry with one or more silicon detectors. A representative sample of a flow stream is obtained from a sampling system. Sample presentation to the analyzer is done with a plow or a flow cell to obtain a uniform interrogation zone for the analyzer. Elemental analysis (Aluminum through Silver on the Periodic Table) of the sample is computed from calibration curves generated from a linear relationship with count rates under each peak. Coal ash is determined from a f(major elements in ash measured, backscattering of incident radiation). Moisture is determined from measuring the attenuation of a microwave beam transmitted through the sample.

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